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Spatial Information in Qualitative Pedagogical Research: Theoretical Assumptions

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Abstract

The study emphasises the role spatial information can fulfil in qualitative pedagogical research. It highlights the phenomenon that, thanks to 21st century innovations in the world of computer assisted qualitative data analysis, geo-references appeared as a possibility of connecting and presenting the spatial dimensions of social processes. The theory-oriented study stresses the role geo-links can fulfil in qualitative research methodology, underscores the connection between geo-references and data triangulation, and also discusses the ethical issues emerging while handling spatial information.

Keywords: CAQDAS, geo-references, data triangulation

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Introduction

The methodological apparatus of 21st-century qualitative, quantitative or third paradigm is based on mixed methods; thus pedagogical research becomes more and more complex. This is justified as pedagogical situations and phenomena are influenced by several factors thus human reality can be interpreted by a multifaceted investigation of these factors. Today, special attention is paid to computer assisted qualitative data analysis (CAQDAS) in the investigation of social processes, which, beyond accelerating data procession, facilitates the enhancement of triangulation-typologies (Flick, 2008).

The present study illustrates the emergence of importance of spatial information in qualitative pedagogical investigations. This will be done by using of CAQDAS as well since it provides the appearance of geo-references in qualitative pedagogical investigations. Furthermore, it emphasizes data triangulation and ethical dilemmas when applying geo-references. It presupposes basic knowledge of research methodology; therefore, it will not explain certain terms (e.g. triangulation) but it will illustrate the role they can play in research.

Innovations in the world of computer assisted qualitative data analysis

Computer assisted qualitative data analysis is an extremely fast-developing field as software developers try to meet the requirements made by researchers thus software are updated with newer and newer versions. Having examined the latest versions of ATLAS.ti™, MAXQDA™ and NVivo™ software packages, "the big three" as Cisneros Puebla and Davidson (2012) call them by referring to their leading role in qualitative research methodology throughout the world, we can state that in terms of innovations central attention is to be placed on the processability of visual data besides providing the integration of quantitative and qualitative data facilitating methodological combinations requied. In other words, in today's qualitative research in social studies it has become possible to analyse spatial information, to use geo-references; GIS™-technology (Geographic Information System™) and the convergence of software packages capable of qualitative data analysis has received focused attention.

When exploring connections between the current trends of qualitative research and computer assisted qualitative data analysis Fielding (2012a) considers the appearance of geographical elements.

As far as innovations are concerned we can be optimistic since computer assisted qualitative data analysis is continuously developing thus the new decades may bring novelties in the field of data procession too (Davidson, 2012; Davidson & DiGregorio, 2011). This is also justified by the "emotional code" (emoticode) function of MAXQDA 11 having appeared in December 2012, which makes coding possible with more than 300 icons and symbols and works in the same way as any other code as the applied symbols substitute the code words (www.maxqda.de). In this case visuality is as dominant as the

emotional approach because the applicable symbols represent an image or a phenomenon. This function makes qualitative data analysis possible from a new perspective for future investigations.

On the basis of the above mentioned facts it is worth considering to what extent different disciplines use the functions of software packages capable of analyzing qualitative data. The different disciplines make use of the available possibilities in different ways: e.g. geo-information is used by sociology and social geography (see the investigations of Cisneros Puebla, 2008), but they appear in other fields as well (see the analysis of Freitas, 2012 on the topic of Participatory Budgeting). Therefore, integrating spatial information into qualitative projects can also be relevant for researchers in the field of pedagogy. How should it take place? Why is it difficult or why is it not obvious how to process spatial information?

Space typologies and the examination of space

Spatial turn as used by Edward Soja at the end of the 1980s has received central attention in space examinations and theoretical treatises in the past decades (Döring & Thielemann, 2008; Stefer, 2011). Spatial turn has reached the world of qualitative research methodology as well since it is worth paying attention to how different disciplines place space into different perspectives and besides the theoretical background it also reveals methodological lessons for qualitative research (see data triangulation).

Space provides a framework for investigating social processes and phenomena (Verd & Porcel, 2012). This statement appears as a basic notion in the process of computer assisted qualitative data analysis because the possibility of integrating geo-information into qualitative research is part of software packages capable of analyzing multicoded data (text, picture, audio- and videodata). When analyzing space, time, geo-information and social processes qualitative social scientific and qualitative geographical approaches may contain shared elements (Fielding & Cisneros Puebla, 2009).

This study does not aim at presenting the different aspects of interpretation of space because it would open a different perspective for analysis. We merely turn our attention to what part multifacetedness of spatial interpretation plays in qualitative pedagogical investigations.

The notion of space is not defined universally as different disciplines interpret it differently. For instance, social space defined by sociologists or hyperbolic space used by mathematicians are based upon different terminological backgrounds, and they assume investigations from different perspectives. Transforming the problem to the world of pedagogy we can encounter similar issues as learning space, individual space, the relationships between space and communication, or the spatial arrangement of

classrooms (Hercz & Sántha, 2009) cannot be discussed, for example, on the basis of how hyperbolic space is used by mathematicians.

There is no universal method for examining space. The following question arises: is it necessary to look for a universal space research when doing research in an interdisciplinary environment or should we require each discipline to create its own space interpretation and its own related terminology? This is an interesting issue mainly because in computer assisted qualitative data analysis the same functions of software packages capable of analyzing multicoded data (texts, pictures, photos, audio- and videodata) can equally well be exploited for geographical, sociological, historical, biological or even pedagogical projects.

The set of instruments for space research is rich in both qualitative and quantitative techniques. Its interdisciplinary nature cannot be proved better by the fact that besides geography, mathematics and economics, even psychology can reveal relevant information for experts studying space from which pedagogy can benefit too. In his study on the methodological background of analyzing objective and subjective space perception Poreisz (2013) claims that the differences between the objective (physical, built) environment and the subjective space as perceived by the individual are due to perception. Different people perceive the world around them differently; therefore, they carry out information processing differently as well. These are relevant ideas for qualitative research methodology as well since subjectivity is emphasized when handling spatial information.

On the basis of the different interpretation methods of space it can be stated that while carrying out computer assisted qualitative data analysis the physical interpretation of space becomes possible in the first place; furthermore, with the help of software packages, we can get a glimpse into the problems of space interpretation emerging on the level of social surface.

Geo-references in qualitative pedagogical research

Stefer (2011) distinguishes direct and indirect references. As far as direct references are concerned we provide the exact spatial matching of data to a point in space clearly determined and defined by coordinates. For instance, if we arrange an interview with an educator about his/her institute, about its surroundings and its architecture, the building can be visualized during the interview by providing the exact coordinates of the building; in this case we guarantee the connection between textual and spatial information with the help of geo-links. Geo-links are capable of making a connection between a text or a picture and a place attached with GPS-coordinates with the help of Google Earth™. Geo-links are novelties in computer-assisted qualitative data analysis since they aid the visualization of spatial coordinates of our social world and it also aids the integration of spatial information into content analysis procedures (Kuckartz, 2012). It also means that in a later phase of the analysation process clicking on the geo-link the

related place (town, street, terrain) can also be visualized. With links like this the environment of data in social studies can be explored.

Indirect references do not link data to a defined point but to a definite part of space, for example, we can illustrate the population density of a county with a map. Another example is medical research which searches for the existence of systematic patterns relating to the given geographical places and the ill health of their residents (Fielding, 2012b). In the world of education geo-references may reveal significant information about the interrelationships of learners' achievement differences and their place and type of residence.

The application of geo-references in qualitative research projects facilitates the analyzation of the effects of space too. During a pedagogical investigation we can turn our attention to how space can influence students' behaviour and lifestyle at school. It can be analysed whether a school provides the possibility of creating individual and community space since these are important parameters of the development of learning space (Hercz & Sántha, 2009). Exploring the relationships of space, behaviour and lifestyle biology may also provide assistance together with spatial information: several ecological environments can be matched to certain communities living together (principle of multiplural environment); at a given time different environments affect the elements of communities. Thus, it is worth taking into consideration the different environmental effects when analyzing students' learning achievements; this is also the case when exploring the behaviour and habits of people living in different geographical units.

Geo-references as elements of data-triangulation

Geo-references in qualitative research methodology contribute to data triangulation and provide a lot of background information. Data collected about the same topic from different sources in different times or at the same time minimize the danger of working with little or limited information and lessen the effects of early impressions and views on the investigation.

Let us suppose that we use geo-references in the field of pedagogical architecture to analyse the micro- and macro-environment of a school building. How can we gather data for the investigation? We can make observations about the school while we arrange interviews with clients of the school; we may look for contemporary or currents newspaper articles and photos and we may also rely on possibilities offered by modern technique like data from the Geographic Information System™ too (Sántha, 2012). This way, based upon the geographical parameters and the GPS coordinates of the building we can receive satellite or street views of the school. With this multiple approach the findings can fulfill the principle of complementarity, they can complement each other and can contribute to a better understanding of the issue (Kelle & Erzberger, 2002; Sands & Roer-Strier, 2006).

Ethical issues if geo-references

Throughout a qualitative research process ethical problems may appear in a complex way. The same applies to the handling of geo-references as well. In case of every investigation we need to guarantee the anonymity of the participants, then we need to turn our attention to the ethical obligations towards the society and our peer researchers and finally, we also need to take into account the appropriate handling and presentation of the data and the findings.

Throughout data analysis process it must be guaranteed that the participants in the research could not be retraced and identified. The same applies to the process of computer assisted qualitative data analysis; however, in the case of handling visual information the problem is complicated as analyzing pictures, photos and geo-references without presenting the visual elements loses its value. It is difficult to guarantee the anonymity of interview details if, thanks to geo-references, they are linked to exact position data (Hughes, 2010) since this way most data are retraceable. The use of Google Earth™ raises further data protection issues: How can the buildings and vehicles appearing in street views and owned by different people be presented in investigations?

The answer to the emerging questions can be that provided this background, this information facilitates data processing, contributes to data triangulation and remain secret in front of the public sphere, they are allowed to be used.

When publishing data and findings one must request the written consent of the people involved since a privately-owned building or car might appear in a photo or in a Google Earth™ illustration; in this case the problem is that it is very difficult or sometimes even impossible to receive the consent of the owners. We need to make an attempt to find out who created the Google Earth™ illustration we used, who uploaded and who owns it. Besides the licence the information is to be handled as a visual source; therefore, exact references need to be indicated.

In qualitative studies it happens often that we cannot – or it is simply impossible to – exclude the presence of the observer. The question that automatically arises is as follows: How does the researcher's subjective effect appear when applying geo-references? Does the applied technique influence the investigation?

Multidimensionality is present when applying geo-references since the database of Google Earth™ is made by people equipped with different technical apparatus and the software packages capable of analyzing multicoded data also make use of them. Perhaps the reader might have met the so-called Google-car while strolling in a city as it was taking photographs. In this case it is not the same direction from which the vehicle is moving down the street as the same building can be recorded from several different perspectives (see lighting conditions, the character of the building from southern or

northern view, whether the vault is covered by trees or not). This way illustrations taken in different ways will get into the database, and while they are used subjective effects can also be sensed at the background information.

Conclusion

The appearance of spatial information in the process of computer assisted qualitative data analysis means a new perspective for data analysis since the resources and terminology of qualitative research methodology were extended with new technical innovations (e.g. geo-links). It is our hope that inestigations concerning education in the future will exploit the possibilities offered by spatial information since there are fields of this discipline (e.g. architecture, mapping micro- and macro-environment of school buildings, student achievement investigations according to regions and settlement types) where background information contribute to triangulation, to professionally executed qualitative research. By observing ethical dimensions it provides an appropriate context for analyses.

Remark

ATLAS.ti © ATLAS.ti GmbH Berlin; Geographic Information System – GIS © 1995-2013 Environmental Systems Research Institute, Inc. (ESRI); Google Earth © Google Inc.; MAXQDA © Udo Kuckartz, VERBI Software. Consult. Sozialforschung. GmbH Berlin; NVivo © QSR International Pty. Ltd.

References

Cisneros Puebla, C. A. (2008). *Developing the convergence of CAQDAS and GIS.* Software Development Seminar ATLASti 6 preview and the convergence of CAQDAS and GIS. University of Surrey UK, 12. november, 2008. Retrieved from http://www.surrey.ac.uk/sociology/research/researchcentres/caqdas/trainingandevents/oneday/software_development_seminar_atlasti_6_preview_and_the_convergence_of_caqdas_and_gis.htm.

Cisneros Puebla, C. A. & Davidson, J. (2012). Qualitative Computing and Qualitative Research: Addressing the Challenges of Technology and Globalization. *Forum Qualitative Sozialforschung / Forum Qualitative Social Research 13*(2), Art. 28. Retrieved from http://nbn-resolving.de/urn:nbn:de:0114-fqs1202285.

Davidson, J. (2012). The Journal Project: Qualitative Computing and the Technology/Aesthetics Divide in Qualitative Research. *Forum Qualitative Sozialforschung / Forum Qualitative Social Research*, *13*(2), Retrieved from: http://nbn-resolving.de/urn:nbn:de:0114-fqs1202152.

Davidson, J. & Di Gregorio, S. (2011). Qualitative research, technology, and global change. In: Denzin, N. K. & Giardina, M. D. (Ed.), *Qualitative inquiry and global crises.* (pp. 79–96.). Walnut Creek, CA: Left Coast Press.

Döring, J. & Thielmann, T. (2008). Einleitung: Was lesen wir im Raume? Der Spatial Turn und das Geheime Wissen der Geographen. In: Döring, J. & Thielmann, T. (hrsg.), *Spatial Turn. Das Raumparadigma in den Kultur- und Sozialwissenschaften.* (pp.7–45). Bielefeld.

Fielding, N. & Cisneros Puebla, C. (2009). CAQDAS-GIS convergence. Toward a New Integrated Mixed Method Research Practice? *Journal of Mixed Methods Research*, 3. vol 4, 349–370. doi: 10.1177/1558689809344973

Fielding, N. (2012a). *Contemporary trends in qualitative research and the use of qualitative software.* The 14th Conference on Computer-aided Qualitative Data Analysis. March 7-10. 2012. Marburg. Retrieved from www.caqd.de/caqd2012.

Fielding, N. (2012b). The Diverse Worlds and Research Practices of Qualitative Software. *Forum Qualitative Sozialforschung / Forum Qualitative Social Research*, 13 (2), Art. 13. Retrieved from http://nbn-resolving.de/urn:nbn:de:0114-fqs1202124.

Flick, U. (2008). *Triangulation. Eine Einführung.* Wiesbaden: VS Verlag.

Freitas, F. (2012). *From Data to Information: Exchanging and Analysing an Extensive Dataset Between Different Software Packages.* CAQD 2012: 14th Conference on Computer-Aided Qualitative Data Analysis. 2012.03.07.-10. Marburg. Retrieved from www.caqd.de/downloads/CAQD2012-Poster-Freitas.pdf.

Hercz, M. & Sántha, K. (2009). Pedagógiai terek iskolai implementációja. [Implementation of pedagogical spaces at school] *Iskolakultúra, 19*(9), 78–94.

Hughes, G. (2010). *Joined-up thinking: using CAQDAS and Google Earth to analyse 'place'.* NCRM Autumn School 2010 – Southampton, NCRM QUIC Node – University of Surrey. Retrieved from http://eprints.ncrm.ac.uk/1575/.

Kelle, U. & Erzberger, C. (2002). Qualitative und quantitative Methoden: kein Gegensatz. In: Flick, U., von Kardorff, E. & Steinke, I. (hrsg.): *Qualitative Forschung. Ein Handbuch*. (pp. 299–309). Hamburg: Rowohlt Verlag.

Kuckartz, U. (2012). *Qualitative Inhaltsanalyse. Methoden, Praxis, Computerunterstützung*. Weinheim und Basel: Beltz Juventa.

MAXQDA 11. Retrieved from www.maxqda.de.

Poreisz, V. (2013). Az objektív és szubjektív térérzékelés vizsgálatának lehetséges módszerei. [Possible techniques for investigating objective and subjective space perception] In: Karlovitz, J. T. (ed.), *Ekonomické stúdie – teória a praxis*. (pp. 369 – 376). Retrieved from www.irisro.org/gazdasagtan2013januar/G437PoreiszVeronika.pdf.

Sands, R. G. & Roer-Strier, D. (2006). Using Data Triangulation of Mother and Daughter Interviews to Enhance Research about Families. *Qualitative Social Work, 5*(2), 237–260. doi: 10.1177/1473325006064260

Sántha, K. (2012). Geo-információk a kvalitatív pedagógiai vizsgálatokban. [Geo-information in qualitative pedagogical investigations] *Iskolakultúra*, *22*(11), 57–65.

Stefer, C. (2011). *Georeferenzierung und mögliche Einsatzfelder in qualitativer Sozialforschung.* Retrieved from http://www.MAXQDA.de/download/Georeferenzierung.pdf.

Verd, J. M. & Porcel, S. (2012). An Application of Qualitative Geographic Information System (GIS) in the Field of Urban Sociology Using ATLAS.ti: Uses and Reflections. *Forum Qualitative Sozialforschung / Forum Qualitative Social Research*, *13*(2), Retrieved from http://nbn-resolving.de/urn:nbn:de:0114-fqs1202144.